

REMARKS

Reconsideration of the instant application is respectfully requested. The present amendment is responsive to the Office Action of September 7, 2005, in which claims 1-12 are presently pending. Of those, claims 1-12 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 6,207,563 to Wieczorek, et al. In addition, claims 1-4, 6-8 and 12 have also been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application Publication 2005/0156202 of Lin, et al. For the following reasons, however, it is respectfully submitted that the application is now in condition for allowance.

As an initial matter, Figures 1(a) through 1(c) have been amended to provide a “prior art” legend as requested by the Examiner. A replacement sheet is submitted herewith.

However, as to the objection to the drawings in regard to reference number 118 of Figure 1(c), the Applicants point out that element 118 (voids) is in fact described in paragraph [0014] of the electronically filed specification, which reads as follows:

“As also stated previously, the volumetric reduction of the reacted cobalt results in stored mechanical energy within the Co/TiN film stack. Depending on the relative thickness of the cobalt and cap layers, delamination or voiding can occur as a result of the differential stresses. A plurality of voids 118 are thus illustrated between the cap layer 116 and newly formed silicide regions 120.”

Thus, since reference number 118 is described in the specification, the Applicants submit the objection to the drawings in this regard has been overcome.

With regard to the outstanding §102 rejections, the Applicants first address the Wieczorek reference. The Applicants have reviewed the same and respectfully traverse

the rejections to claims 1-12 since there is no teaching in Wieczorek of “a counter tensile layer over said second layer, wherein said counter tensile layer is selected from a material such that an opposing directional stress is created between said counter tensile layer and said second layer, with respect to a directional stress created between said first layer and said second layer.”

In particular, a review of the figures in Wieczorek reveals that there is no additional layer whatsoever that is formed over the cap (gettering) layer 70 in Figures 6 and 7. In other words, if the “first” layer in Wieczorek is considered to be the refractory metal layer 66 blanket-deposited over the substrate, and the “second” layer is considered to be layer 70 (formed over layer 66), then there is still no counter tensile layer over layer 70 so as to create an opposing directional stress with respect to a directional stress created between layer 70 and layer 66, as is presently claimed in the instant application. Therefore, since a counter tensile layer over the second layer is missing from Wieczorek, claims 1-12 cannot be anticipated thereby, and it is respectfully submitted that the §102 rejections on this basis have been overcome.

Second, with regard to the Lin reference, the Applicants submit that Lin does not teach or suggest forming a cap layer over a refractory metal layer and a counter tensile layer over the cap layer. In the “Figure 5” embodiment of Lin, the second layer 552 over layer 550 and beneath layer 560 is not actually a cap layer as is claimed in the present application, but is instead a second metal layer of a different type than the first layer 550. Moreover, this second layer 552 is also used as a silicide metal and thus not as a cap layer to protect the silicide metal from contamination during anneal.

As is indicated in the background section of the specification, in the context of silicide contact formation, cap layers (e.g., titanium nitride) are used in a protective fashion where the silicide metal is of a type (e.g., cobalt) that is susceptible to contamination during anneal. However, in paragraph [0079] of Lin, it is stated that:

“The second metal portions 552, 582 may comprise nickel, cobalt, tungsten, tantalum, titanium, platinum, erbium, palladium, or any other metal *able to interact with silicon at an elevated temperature to form silicide* in a low resistance phase state.”
(Emphasis added)

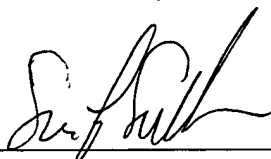
Thus, the second metal layer 552 in Lin is simply one layer of the entire refractory metal stack (i.e., a 3-layer stack for the NMOS case and a 2-layer stack for the PMOS case; see Lin, paragraphs [0079]-[0081]). As such, the second layer 552 does not serve as a cap layer as is presently claimed. The Applicants therefore respectfully traverse the rejection of claims 6-8 and 12 based on Lin, while the amendment to claim 1 (incorporating the elements of now cancelled claim 5) has overcome the rejections to claims 1-4 based on Lin.

Accordingly, since neither Wieczorek nor Lin teaches or suggests each element of the remaining pending claims, the present amendment has overcome the §102 rejections thereto, and it is respectfully requested that the same be withdrawn.

For the above stated reasons, it is respectfully submitted that the present application is now in condition for allowance. No new matter has been entered and no additional fees are believed to be required. However, if any fees are due with respect to this Amendment, please charge them to Deposit Account No. 09-0458 maintained by Applicants' attorneys.

Respectfully submitted,
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